Application No.: 10/812,433 **Docket No.: JCLA12461**

AMENDMENT

In The Claims:

Claim 1. (currently amended) A method of manufacturing a metal-oxide-semiconductor (MOS) transistor, comprising the steps of:

providing a substrate having a gate structure thereon;

forming a source/drain extension region in the substrate on each side of the gate structure;

forming a carbon-containing material layer over the substrate, wherein gases used to form the carbon-containing material layer comprises ethylene (C2H4), hexachlorosilane (HCD), ammonia and nitrogen;

etching back the carbon-containing material layer to form a spacer on each sidewall of the gate structure; and

forming a source/drain region in the substrate on each side of the spacer-coated gate structure.

Claim 2. (original) The method of claim 1, wherein the step of forming the carbon-containing material layer comprises performing a chemical vapor deposition process.

Claim 3. (canceled)

Claim 4. (currently amended) The method of claim ~~3~~1, wherein the flow rate of ethylene is set to a value between 100sccm to 1200sccm in the chemical vapor deposition process.

Claim 5. (currently amended) The method of claim ~~3~~1, wherein the hexachlorosilane to ammonia ratio is set to a value between 2.5% to 8% by volume in the chemical vapor deposition process.

Claim 6. (currently amended) The method of claim ~~3~~1, wherein the flow rate of hexachlorosilane is set to a value between 12sccm to 20sccm in the chemical vapor deposition process.

Claim 7. (currently amended) The method of claim ~~3~~1, wherein the flow rate of nitrogen is set to a value between 300sccm to 1800sccm in the chemical vapor deposition process.

Claim 8. (currently amended) The method of claim ~~3~~1, wherein the chemical vapor deposition process is carried out at a temperature between about 450°C to 600°C.

Claim 9. (currently amended) The method of claim ~~3~~1, wherein the chemical vapor deposition process is carried out at a pressure between 0.2 torr to 2.5 torr.

Claim 10. (currently amended) ~~The method of claim 2, wherein the gases used in the chemical vapor deposition process~~ A method of manufacturing a metal-oxide-semiconductor (MOS) transistor, comprising the steps of:

providing a substrate having a gate structure thereon;

forming a source/drain extension region in the substrate on each side of the gate structure;

forming a carbon-containing material layer over the substrate, wherein gases used to form the carbon-containing material layer comprises bis(tert-butylamino)silane (BTBAS), oxygen, ammonia and nitrogen~~.~~;

etching back the carbon-containing material layer to form a spacer on each sidewall of the gate structure; and

forming a source/drain region in the substrate on each side of the spacer-coated gate structure.

Claim 11. (original) The method of claim 10, wherein the flow rate of the bis(tert-butylamino)silane is set to a value between about 75sccm to 110sccm.

Claim 12. (original) The method of claim 10, wherein the bis(tert-butylamino)silane to ammonia ratio is set to a value between 15% to 20% by volume in the chemical vapor deposition process.

Claim 13. (original) The method of claim 10, wherein the bis(tert-butylamino)silane to oxygen ratio is set to a value between 10% to 30% by volume.

Claim 14. (original) The method of claim 10, wherein the flow rate of nitrogen is set to a value between 110sccm to 200sccm.

Claim 15. (original) The method of claim 10, wherein the chemical vapor deposition process is carried out at a temperature set between about 50°C to 600°C.

Claim 16. (original) The method of claim 10, wherein the chemical vapor deposition process is carried out at a pressure between 0.2 torr to 2.5 torr.

Claim 17. (currently amended) ~~The method of claim 1, wherein the step of forming the carbon-containing material layer comprises:~~ A method of manufacturing a metal-oxide-semiconductor (MOS) transistor, comprising the steps of:

providing a substrate having a gate structure thereon;

forming a source/drain extension region in the substrate on each side of the gate structure;

~~performing a deposition process to form~~ forming a material layer over the substrate; and

performing an ion implantation to implant carbon ions into the material layer.

etching back the carbon-containing material layer to form a spacer on each sidewall of the gate structure; and

forming a source/drain region in the substrate on each side of the spacer-coated gate structure.

Claim 18. (original) The method of claim 17, wherein the deposition process further comprises:

placing the substrate inside a reaction chamber; and

introducing gaseous hexachlorosilane, nitrogen and ammonia into the reaction chamber so that the gases react to deposit material onto the substrate.

Claim 19. (original) The method of claim 1, wherein before the step of forming the carbon-containing material over the substrate, further comprises forming an oxide liner layer over the substrate and the gate structure.

Claim 20. (newly added) The method of claim 10, wherein before the step of forming the carbon-containing material over the substrate, further comprises forming an oxide liner layer over the substrate and the gate structure.

Claim 21. (newly added) The method of claim 17, wherein before the step of forming the carbon-containing material over the substrate, further comprises forming an oxide liner layer over the substrate and the gate structure.